form a fourth family of the order Marchantiales: Ricciaceae, Corsiniaceae, Riellaceae, Marchantiaceae, rather than be placed as an aberrant family in the Jungermanniales anacrogynae.—C. R. B.

Cleistogamy.—The examination of a large number of cleistogamous flowers of monocotyls and dicotyls showed HELENE RITZEROW[18] that all are reductions from the chasmogamous forms, and that the reductions follow a definite direction determined by the normal development of the chasmogamous form. The mode of reduction in the various floral parts is described in detail. The pollen grains of many forms germinate within the anther, the pollen tubes emerging in various ways. Chasmogamous flowers are generally so situated upon the plant that they receive better nourishment than the cleistomagous. So many forms are described that the work will be good for reference.

TUZSON[19] has observed for six years two trees of *Robinia Pseudo-Acacia*, 30 to 40 years old, and has found them producing only cleistogamous flowers. Adventitious shoots, six years old, from these trees also produce only cleistogamous flowers. The author believes that in this case the cleistogamy is entirely independent of external conditions and due rather to inner causes.—CHARLES J. CHAMBERLAIN.

Fossil polar plants.—NATHORST,[20] in connection with the publication of the results of the Russian Polar Expedition of 1900–1903, has given an account of the Triassic and Jurassic plants from the Island of Kotelny. Schizoneura is the only Triassic plant. Among the most interesting Jurassic remains are the leaves and cone scales of a pinelike conifer. As the affinity of these is not absolutely certain in the absence of structural evidence, they are denominated Pityophyllum and Pityolepis respectively. The scales present a remarkable appearance, for broadening from the base they narrow abruptly to an isthmus about the middle, to expand again at their upper ends. The question naturally suggests itself, whether the upper region does not correspond to the apophysis of modern pines. The reviewer has found somewhat similar cone scales in the Lower Cretaceous. The author takes occasion to criticize the erroneous reference of probable pine needles to the problematical Jurassic genus Cyclopitys (Sciadopitys). The latter he does not consider to form properly an element of the flora of the Mesozoic as it occurs in the northern hemisphere.—E. C. JEFFREY.

Phylogeny of Archegoniatae and Characeae.—SCHENCK[21] regards the bryophytes, pteridophytes, and Characeae as unrelated groups, the first two having

[18] RITZEROW, HELENE, Ueber Bau und Befruchtung kleistogamer Blüthen. Flora **98**:163–212. *figs. 36.* 1907.

[19] TUZSON, JOHANN, Ueber einen neuen Fall der Kleistogamie. Bot. Jahrb. Systematik, Pflanzengeschichte, und Pflanzengeographie **40**:1–14. *pls. 1, 2.* 1907.

[20] NATHORST, A. G., Mém. Acad. Imp. Sci. St. Petersbourg VIII. **21**: no. 22. 1907.

[21] SCHENCK, HEINRICH, Ueber die Phylogenie der Archegoniaten und Characeen. Engler's Bot. Jarhb. **42**:1–37. 1908.

come from the brown algae, and even the Characeae showing more resemblance to the brown algae than to other green algae. The origin of antheridia and archegonia from a plurilocular sporangium is developed along the lines already presented by DAVIS and HOLFERTY. To some of us, it would seem better to derive antheridia and archegonia from plurilocular sporangia of some hypothetical green alga than to refer them directly to the plurilocular sporangia of brown algae. The spore mother cells of archegoniates are compared with the unilocular sporangia of the brown algae, and the sporophyte of archegoniates with the thallus of brown algae. SCHENCK does not believe the sporophyte of pteridophytes can be derived from that of bryophytes. Even the complicated antheridium of the Characeae is referred to the plurilocular sporangium of the brown algae.—CHARLES J. CHAMBERLAIN.

Translocation in green tissues.—RYWOSCH points out[22] that translocation must depend upon the concentration gradient from the peripheral cells to the vascular bundle. This gradient is due in part to the excess of food made in the cells best illuminated, and also to the fact that transpiration cooperates doubly, by reducing the amount of water and by determining the movement of water. Thus those cells next the bundle are first to receive the water supply and those nearer the periphery are driest. He shows that the emptying of leaf tissues is not simultaneous, peripheral ones being emptied first, and that the whole process is greatly retarded when transpiration is checked. [Yet it must not be forgotten that there are plants in which transpiration cannot be invoked as an aid to translocation, since it is practically non-existent for weeks or months at a stretch.] The concentration is also kept low in the inner cells by the making of starch in them. RYWOSCH also adds a note on the function of the starch sheath, holding that its character as a reserve is very doubtful.—C. R. B.

Hygroscopic living leaves.—HANNIG[23] reports what he says is the first recorded instance of the movement of living leaves produced by variations in the water-content of the cell walls. The leaves of various hardy species of Rhododendron rise and fall, roll and unroll, according as they are subject to freezing and thawing weather respectively, though the same movements may be produced by other conditions which reduce or increase the water-content of the cell walls. Turgor is not concerned, HANNIG says, because dead or live, narcotized or unnarcotized, leaves exhibit movements equal in extent and kind. HANNIG'S argument is not convincing, and it seems unlikely that this conclusion is sound. In fact, too little is known of the physics of water and cell contents under the conditions described to make it possible to state accurately the precise relations involved.—C. R. B.

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[22] RYWOSCH, S., Sur Stoffwanderung im Chlorophyllgewebe. Bot. Zeit. **66**[1]: 121–130. *figs. 2.* 1908.

[23] HANNIG, E., Ueber hygroskopische Bewegungen lebender Blätter bei Eintritt von Frost und Tauwetter. Ber. Deutsch. Bot. Gessells. **26a**: 151–166. 1908.